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ABSTRACT

Sixty-three fifth-grade children completed daily activity diaries indicating how they spent their non-school time for 15 days. From these diaries, estimates of the minutes per day that were spent in various activities were derived. The estimate of book-reading time from the activity diary correlated with new measures of individual differences in exposure to print that use a checklist-with-foils logic and that have very brief administration times. Both diary-estimated and checklist-estimated book reading predicted a variety of verbal outcome measures, but estimates of television watching did not. Multiple-regression and factor analysis confirmed the convergent and discriminant validity of a construct that, it is argued, is best conceived of as non-school print exposure and that appears to be measured as well by the checklist tasks as by the activity diary method. In contrast, certain types of questionnaire methods of assessing reading habits and attitudes appear to assess the extent of general positive attitudes toward reading rather than the degree of print exposure itself. Six tables and 1 figure present study data, and a 56-item list of references and 3 appendices of book title recognition items are included. (Author/SLD)

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Multiple Indicators of Children's Reading Habits and Attitudes: Construct Validity and Cognitive Correlates

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Abstract

Sixty-three fifth-grade children completed daily activity diaries indicating how they spent their nonschool time for 15 days. From these diaries, estimates of the minutes per day that were spent in various activities were derived. The estimate of book-reading time from the activity diary correlated with new measures of individual differences in exposure to print that utilize a checklist-with-foils logic and that have very brief administration times. Both diary-estimated and checklist-estimated book reading predicted a variety of verbal outcome measures, but estimates of television watching did not. Multiple-regression and factor analysis confirmed the convergent and discriminant validity of a construct that we argue is best conceived of as nonschool print exposure and which appears to be measured as well by the checklist tasks as by the activity diary method. In contrast, certain types of questionnaire methods of assessing reading habits and attitudes appear to assess the extent of general positive attitudes toward reading rather than the degree of print exposure itself.

Multiple Indicators of Children's Reading Habits and Attitudes: Construct Validity and Cognitive Correlates

We are in the middle of a perhaps unprecedented campaign to immerse children in authentic literature from their earliest encounters with print (Manning & Manning, 1989; Strickland & Morrow, 1989; Teale & Sulzby, 1986; Temple, Nathan, Burris, & Temple, 1988) and to develop positive reading habits among children (Trelease, 1989). These efforts to foster positive reading habits represent an expansion of our conception of positive educational outcomes in the domain of reading (Stanovich, 1992).

Coinciding with the recent emphasis on developing positive reading habits is an emphasis on the cognitive benefits of free reading (e.g., Anderson, Wilson, & Fielding, 1988; Krashen, 1989; Snow, Barnes, Chandler, Goodman, & Hemphill, 1991). Amount of free reading outside of school has consistently been found to relate to vocabulary, comprehension ability, and other verbal skills (Anderson et al., 1988; Cunningham & Stanovich, 1991; Greaney, 1980; Greaney & Hegarty, 1987; Guthrie & Greaney, 1991; Stanovich, 1986, in press; Stanovich & Cunningham, 1992), although determining the proper causal interpretation of these relationships is a complex problem (Anderson et al., 1988; Guthrie, Schafer, & Hutchinson, 1991; Taylor, Frye, Maruyama, 1990).

Researchers have taken a number of different approaches to the measurement of reading habits and dispositions. Some have focused on assessing attitudes via questionnaire techniques (e.g., Estes, 1971; Guthrie & Greaney, 1991; Lewis & Teale, 1980). Others have attempted to assess the absolute amount of time spent reading by using guided interviews (e.g., Guthrie & Seifert, 1983; Mikulecky, 1982). Still other researchers have utilized diary techniques, reading logs, and daily activity records (Anderson et al., 1988; Greaney, 1980; Taylor et al., 1990). Finally, our research group has utilized literature recognition measures as proxy indicators of reading outside of school (e.g., Cunningham & Stanovich, 1990, 1991; Stanovich & Cunningham, 1992; Stanovich & West, 1989). The latter measures do not provide estimates of absolute amounts of time spent reading, as do the daily time diary methodologies, but they appear to be sensitive indicators of relative individual differences in exposure to print.

Further research progress in tracking the effects of reading habits is contingent upon a more refined knowledge of the differences and similarities

among instruments currently in use. In the present investigation, we assessed the convergent validity of a variety of indicators of reading habits and dispositions. Specifically, we examined whether more indirect indicators of reading habits and attitudes converged with more direct measures, such as time spent reading estimated from daily activity diaries. That is, based on the work of Anderson et al. (1988) and others (e.g., Greaney, 1980), it would seem reasonable to consider the daily activity diary method as the benchmark indicator of children's print exposure. Certainly no other indicator has the degree of content, convergent, and criterion validity than that demonstrated by the activity diary used in the Anderson et al. (1988) study. Studies focused on problems other than literacy have also indicated that activity diaries are more reliable than interview or questionnaire instruments (Carp & Carp, 1981). Thus, the convergent validity of other indicators of reading habits was assessed by reference to the results obtained using an activity diary methodology. Criterion validity for all the measures of print habits and attitudes was assessed by employing several indicators of verbal ability and knowledge.

Method

Subjects

The children were recruited from a private school that was not religiously affiliated. There were 63 fifth-grade children in the sample (38 boys and 25 girls), distributed in four different classrooms. The mean age of the children was 10 years, 10.7 months (SD = 4.7 months). The school makes a concerted effort to attract students from a variety of socio-economic backgrounds and 11% percent of the students receive financial aid. The language arts program emphasizes the use of children's literature. There is a monthly home reading requirement of two student-selected books, and the students also have a summer reading requirement of two school-selected novels. Data collection took place during two periods, one during mid-January and the other from mid-April to early-May. The activity diaries were completed during the mid-April to early-May period.

Daily Activity Diaries

Our method of collecting daily activity records borrowed heavily from the time diary investigation of Anderson et al. (1988). However, we also attempted to improve on their methods in several respects. Our daily activity record-keeping procedure was designed to minimize the time students would

need to spend on it during the school day; to minimize the necessity for adding and subtracting minutes or converting hours into minutes; and to maximize student judgment accuracy.

Our forms divided the children's activities into nearly exhaustive and mutually exclusive categories, as did Anderson et al. The major categories on our form are listed in Table 1. One additional category, Writing, was used so little that it is omitted from the table. The variable All Reading in Table 1 (which did not appear on the form) was formed by combining Comics Reading time and Book Reading time (with and without title) with the category Other Reading which appeared on the form. Categories were selected based on previous research (e.g., Anderson et al. 1988, Greaney, 1980) and based on our own pilot surveys of fifth-grade children. The Other category was to be used for all reading activities not encompassed by our list (e.g., newspapers, magazines).

An innovation in our procedure was that we used a graphical layout in order to provide the children with a visual aid for their time estimates, unlike Anderson et al. who required purely numerical estimates. A recording sheet was designed which listed the categories of activities at each end of an 11 by 8-1/2 inch sheet (see Figure 1). Extending across each row were time lines extending from 2:00 PM to 11:00 PM divided into quarter hours by small hash marks and with larger lines running completely down the page identifying hours. The hour lines were identified (2:00, 3:00, etc.) at the top of the page. The sheets for recording Sundays were slightly different because of the number of hours that needed to be recorded. The Sunday sheets consisted of one of the weekday sheets with an additional sheet stapled on top. The top sheet had the same categories in the same order but the times began at 5:00 AM and ended at 2:00 PM (i.e., where the second sheet began). Students were given a folder in which to keep their completed diary sheets.

Insert Figure 1 about here

Five activity sheets were collected per week: activity reports from Sunday through Thursday, respectively. Students filled out activity sheets each school day recording their previous day's activities. Thus, Sunday's activities were recorded on Monday, Monday's activities on Tuesday, etc. The

children were instructed to date each sheet as they began and to draw a line vertically down the sheet to indicate the time that they arrived home from school (or the time they woke up on Sunday) and a second line vertically to mark when they went to bed. They were then asked to account for all of the time in between by marking horizontally on the time line the length of time in which they were engaged in activities indicated on the sheet (or to use the Other category for activities not listed). The children used a highlighter to draw over the time line. Two categories required the child to indicate more than just the time. When children indicated time in the Other category they were asked to write (on a line provided with that category) the name of the activity in which they were engaged. Similarly, for the book reading category, the children were asked to indicate the name of the book. We found, as did Anderson et al. (1988), that time estimates calculated only from instances where the child identified a book were better predictors than book time estimates that included instances where a child did not identify a title. Therefore, the book time estimates that follow are based only on instances where the child identified a book. This is the procedure adopted by Anderson et al. in accordance with their argument that identified instances are more valid indicators of actual book reading (see, Anderson et al., 1988, p. 289). In scoring book time, we accepted any response from the child that was in any way decipherable as a book title (i.e., the title that the child wrote down did not have to be exactly correct, as long as it was recognizable as the title of some book).

One of the experimenters met with each class to give the directions and discuss the project. Using an overhead projector, the experimenter filled out a diary sheet and discussed it with the class. In each of the students' folders was a copy of the directions and examples of the types of activities that were appropriate to each category. The examiners also discussed the types of activities and how they would be classified. Simultaneous activities--such as babysitting while the television was on--were also discussed. For example, in this case, if a student was watching television while with the supervised child, they were told to record the time as TV. However, if they were supervising the young child or preparing meals for the younger child, then they were told to record babysitting in the Other category. Students then completed a practice sheet for their activities on the previous night. Completion of the practice sheet was followed by a period of questions about

the forms, during which the children could ask the experimenter about any aspect of the form that confused them. Children were not told that the study was focused on reading time.

In discussing the categories for reading, care was made to discriminate for the students between the types of reading. Book reading was to include any books that were not specifically assigned by the school. Other Reading was to include books that had to be read in order to complete a school assignment such as core books (books that the children were assigned to read at some time during the year) or Junior Great Books (also a school activity). Other Reading also included newspaper and magazine reading. Comic book reading did not need much explanation other than that Mad Magazine was a comic rather than a magazine. Homework was to include any reading done from textbooks or related books dealing with classroom assignments.

The diary sheets were filled out during the first few minutes of the Language Arts period which could be either morning or afternoon. The language arts teacher closely monitored the completion of the activity sheets for the first two days. For the remaining days, the teacher was available to answer student questions. An attempt was made to collect 15 days of activity records for each child. Our diary collection period was longer than that of Greaney (1980; Greaney & Hegarty, 1987) but shorter than that of Anderson et al. (1988). The present study is thus intermediate in length when compared to these previous benchmark investigations.

Because of the inevitable absences, four additional recording days were added on to the end of the 15 primary days of recording in order to give children with absences in the first 15 days a chance to make up the recording days. The 61 children who finished with relatively complete activity records filled out a mean of 14.1 records (SD=1.4), 12.0 (SD=1.0) weekdays and 2.1 (SD=0.8) Sundays. There were no significant correlations between the number of days of completed records and any other variable in the study.

In a few cases where students had left gaps in their records, we assigned the missing time to the Other category. Also, there were a few instances of the use of the Other category in which we changed the categorization in order to more accurately reflect what had been done. An example would be when a child coded going to a grandmother's birthday party in "Other," we reclassified it as being in the Family Things category.

The daily activity diaries were analyzed by summing the times in each

category across days and dividing by the number of recorded days for that student. This resulted in estimates of the number of minutes per day that each student engaged in each activity. Split-half reliabilities are presented in Table 2 and will be discussed in the Results section. As a comparison of the means and medians in Table 1 indicates, the times in most of the categories were positively skewed, particularly book-reading time. This finding replicates the findings of Anderson et al. (1988; see also, Sharon, 1973-74). We followed their procedure of adopting a logarithmic transform (natural log of m + 1, where m is the estimated minutes per day) of the category times for some correlational analyses. As in their study, book-reading times displayed slightly larger correlations after the transformation.

We tried creating proportional scores by dividing the time spent in each category by the total amount of time recorded. This resulted in a proportional score reflecting the fraction of waking nonschool time that the child spent in that activity. However, this proportional transformation did not increase correlations over and above those obtained with the raw time estimates, and so the proportional scores will not be considered further.

Other Print-Exposure Measures

Title Recognition Test (Form 1). The Title Recognition Test (TRT) was designed as an analog of recognition measures that had previously been used to assess amount of exposure to print in adults (Stanovich & West, 1989). These measures employ a signal-detection logic whereby subjects must recognize actual target items (real book titles in the case of the TRT and real authors in the case of the adult measure) when they are embedded among foils (phrases that are not book titles or author names, respectively). There are several advantages to this checklist-with-foils method. First, it is immune to the social desirability effects that so often contaminate responses to subjective self estimates of socially-valued activities such as reading (Furnham, 1986; Paulhus, 1984). Guessing is not an advantageous strategy because it is easily detected and corrected for by an examination of the number of foils checked. Further, the cognitive demands of the task are quite low. Although checklist procedures have been used before to assess print exposure (C. Chomsky, 1972; Huck, 1966), they have not been employed in the context of a method that uses foils to control for differential response criteria.

The version of the TRT employed in the present investigation was similar to the children's measure used in previous research on print-

exposure effects (Cunningham & Stanovich, 1990, 1991). The version used in this investigation consisted of a total of 40 items: 25 actual children's book titles and 15 foils for book names. The titles were selected from a sample of book titles generated by groups of children in pilot investigations, by examining various lists of children's titles, and by consulting teachers and reading education professionals knowledgeable about current trends in children's literature. The list of children's titles appearing on the TRT is presented in Appendix A, along with the percentage recognition for each item. The foil titles are listed at the bottom of Appendix A, but on the actual TRT forms they were interspersed with the real titles. In selecting the 25 items to appear on the TRT, we attempted to choose titles that were not prominent parts of the classroom reading activities in the particular school participating in this investigation. Because we wanted the TRT to probe out-of-school rather than school-directed reading, we avoided books that were regularly studied in the school curriculum. Note that this characteristic of the task makes it unlikely that a form including exactly these items will be as valid when used in other schools and classrooms. Individualized construction of the form is recommended.

The instructions that were read to the subjects and that were printed on their response sheets were as follows: "Below you will see a list of book titles. Some of the titles are the names of actual books and some are not. You are to read the names and put a check mark next to the names of those that you know are books. Do not guess, but only check those that you know are actual books. Remember, some of the titles are not those of popular books, so guessing can easily be detected." On the response sheet that the subjects completed, this measure was labeled the Title Recognition Questionnaire and was referred to in this manner by the experimenter. The TRT took approximately five minutes to administer. For each subject, the number of correct targets identified was recorded, as well as the number of foils checked. The mean corrected score was .586 (SD = .183). The split-half (odd/even) reliability of the number of correct items checked (Spearman-Brown corrected) was .84. Calculating Cronbach's alpha produced a reliability estimate of .80. Scoring on the task was determined by taking the proportion of the correct items that were checked and subtracting the proportion of foils checked. This is the discrimination index from the two-high threshold model of recognition performance (Snodgrass & Corwi

1988). Other corrections for guessing and differential criterion effects (see Snodgrass & Corwin, 1988) produced virtually identical correlational results. Form 1 of the TRT was administered to 59 children during the first testing period in January.

Title Recognition Test - (Form 2). Form 2 of the TRT was constructed, scored, and administered in the same manner as Form 1, except that it contained different items and foils. Form 2 was administered to 47 children during the second testing period. In compiling the titles for Form 2, an attempt was made to select titles which reflected more varied genres than were present in Form 1. Form 2 included folk tales (e.g., "Rapunzel"), nonfiction (e.g., "Magic Schoolbus Inside the Earth", "The Way Things Work"), and works by minority authors (e.g., "Roll of Thunder, Hear my Cry", "Scorpions", "M.C. Higgins the Great"). There were 25 actual book titles and 16 foils on Form 2. Instructions, administration, and scoring were the same as for Form 1. The mean corrected score was .471 (SD = .165). The split-half (odd/even) reliability of the number of correct items checked (Spearman-Brown corrected) was .82. Calculating Cronbach's alpha produced a reliability estimate of .78. The list of children's titles appearing on Form 2 of the TRT is presented in Appendix B, along with the percentage recognition for each item. Two extremely alluring foils (see Appendix B) reduced the scores somewhat on this Form.

Author Recognition Test. The Author Recognition Test (ART) was a children's version of a measure used in previous adult studies of print exposure (Stanovich & West, 1989). Although it had originally been felt that the use of authors in a recognition checklist might be too difficult for children (which is why our initial work concentrated on the TRT measure), pilot work in several classrooms indicated that children of this age could successfully respond to an author recognition measure and that performance on the task was diagnostic, even though, as expected, recognition performance on the ART tends to be lower than that on the TRT.

Authors on the measure were chosen using the same procedures employed for the TRT. There were 40 names on the test: 25 actual children's authors and 15 foil names. The list of children's author names appearing on the ART is presented in Appendix C, along with the percentage recognition for each item. The foils were names drawn from the bibliography of Arthur Heilman's Principles and Practices of Teaching Reading (3rd Ed.). The 40

names were randomly ordered. Directions on the ART were the same as those on the TRT with suitable alterations for content. The ART was scored just as the TRT, each child's score being determined by taking the proportion of the correct items that were checked and subtracting the proportion of foils checked. Fifty-nine of the children completed the ART. The mean corrected score was .319 (SD = .154). The split-half (odd/even) reliability of the number of correct items checked (Spearman-Brown corrected) was .86. Calculating Cronbach's alpha produced a reliability estimate of .81.

Comics Recognition Test. The comics recognition test was developed as a counterpart to the ART and TRT in order to tap a different type of reading. In determining the list of comics, we attempted to select titles that were not the titles of cartoon television programs but it was difficult to avoid overlap entirely, and some of our titles (e.g., Richie Rich, Wonder Woman, Heathcliff, and Peanuts) had corresponding television programs. The comics recognition test consisted of 24 titles of comics—both comic books and comic strips--and 16 foils. All 40 items were listed in a random order and the children were asked to put a check on the line by the titles that they knew. Instructions, administration, and scoring were analogous to the other checklist measures. Fifty-seven children completed the comics recognition test. The mean corrected score was .331 (SD = .138). The split-half (odd/even) reliability of the number of correct items checked (Spearman-Brown corrected) was .68. Calculating Cronbach's alpha produced a reliability estimate of .76.

Print Disposition Measures

Activity Preference Questionnaire. The instructions for the Activity Preference Questionnaire were printed on a sheet placed in front of the children and were read aloud by the experimenter as the children read along: "Below you will be given a choice between doing one of two activities. Please put a check mark next to the one that you prefer. Please mark only one. That is, even if you like both activities, please mark only the one you like best. Even if you dislike both activities, mark the one that you would prefer to do. For each item, please mark only one choice." There followed 12 forced choices for the children, in the format: "I would rather: a. listen to music of my choice, b. watch a television program of my choice". Each item, as well as the two choices, was read aloud to the students. After reading an item aloud, the experimenter said the words, "Mark one."

Six of the questions concerned reading. In these six items "read a book of my choice" was pitted against "watch a television program of my choice", "play an outdoor sport of my choice", "listen to music of my choice", "talk with friends of my choice", "attend a movie of my choice", and "spend time on my hobbies". The subject's score on the task was simply the number of times that reading was chosen over one of these six activities. Reading preference scores thus ranged from 0 to 6. The children were also given a television preference score (ranging from 0 to 5) based on the number of times they chose "television" in the five items in which it appeared. Sixty children completed the Activity Preference Questionnaire.

Literacy and Media Habits Questionnaire. Sixty of the children completed a Literacy and Media Habits Questionnaire that contained questions about reading, television, and study habits. The literacy questions probed whether the student went to the public library, wrote at home, liked to read, and read comics or magazines at home. The children were asked a question concerning the homework they completed on the previous night. Three questions probed television watching. One asked how much they liked television, another whether they had watched on the previous night, and another how many hours they watched on most days.

Only one of the literacy questions displayed significant correlations with other variables in the study, a question in which the children completed the sentence "I like to read" by choosing from among the alternatives "very much", "a little", and not very much". This item--which will be termed the Reading Disposition Question--correlated more strongly with other variables in the study than did a composite score including all of the literacy items. Thus, it was used on its own as a reading disposition index.

A composite score based on the three television items, did, however, correlate more highly with other variables in the study than did any single television item. The television composite score was formed by converting responses to each of the three questions to z-scores and then averaging the three z-scores. Higher scores reflected more reported interest in television.

Elementary Reading Attitude Survey. The Elementary Reading Attitude Survey (ERAS) is a public-domain instrument designed to give teachers an easy method of assessing attitudes toward reading (McKenna & Kear, 1990). The instrument was printed in its entirety in the May 1990 issue of The Reading Teacher, along with reliability and validity information. The

authors' goal was to create an instrument that would "(a) have a large-scale normative frame of reference; (b) comprise a set of items selected on the basis of desirable psychometric properties; (c) have empirically documented reliability and validity; (d) be applicable to all elementary students, Grade 1-6; (e) possess a meaningful, attention-getting, student-friendly response format; (f) be suitable for brief group administration; and (g) comprise separate subscales for recreational and academic reading" (McKenna & Kear, 1990, p. 627).

The ERAS contains 20 questions, 10 related to attitudes toward recreational reading and 10 related to attitudes toward academic reading. Each item begins with the words, "How do you feel". Sample recreational items include attitudes about "getting a book for a present", "reading during summer vacation". Examples of academic items include "doing reading workbook pages and worksheets", and "learning from a book".

One important aspect of the ERAS is that children indicate their responses to questions in a pictorial format that utilizes the cartoon figure Garfield. Four Garfields are used to represent responses which indicated very happy, two more neutral positions, and very unhappy. Children circle the picture that reflects how they feel about the particular statement.

We departed from the recommended procedure for administering the ERAS in one respect. The directions (see McKenna & Kear, 1990) call for the teacher to read the items to the students. In pilot investigations using the instrument, we observed that the classroom atmosphere seemed to allow some students to make verbal comments on the items that may have distracted other children. As a result of these pilot experiences, we altered the administration of the ERAS by asking the students to read the items silently and to mark their responses at their own speed.

Each item on the ERAS was scored 1,2, 3, or 4 points, with 4 indicating that the child responded by circling the happiest Garfield and a 1 indicating that the child responded by circling the unhappiest Garfield. Scores on the 10 recreational items and the 10 academic items were summed separately to yield ERAS - recreational and ERAS - academic scores. The correlation between the recreational and academic items was .52, somewhat lower than the .64 reported in the normative sample (McKenna & Kear, 1990). The split-half (odd/even) reliability of the recreational scale (Spearman-Brown corrected) in this sample was .88 and the split-half reliability of the academic

scale was .81. Forty-six children completed the ERAS.

Criterion Tasks

Vocabulary Checklist - Form 1. Several studies have demonstrated that the checklist-with-foils format is a reliable and valid way of assessing individual differences in vocabulary knowledge (Anderson & Freebody, 1983; Cooksey & Freebody, 1987; Meara, & Buxton, 1987; White, Slater, & Graves, 1989; Zimmerman, Broder, Shaughnessy, and Underwood, 1977). Research has demonstrated that the checklist format is at least as sensitive and valid as multiple-choice tasks (Anderson & Freebody, 1983; White et al., 1989). Thus, this format was retained for one of our measures of vocabulary. The stimuli for this task were 27 words (solar, ankle, swamp, wrist, argument, competition, judicial, antler, snarling, grooming, composer, fragment, wedge, compass, gnawing, nuisance, bugle, scholar, musician, parallel, portable, construction, funnel, cliff, secretary, shore, angle) taken from Form M of the Peabody Picture Vocabulary Test - Revised (Dunn & Dunn, 1981) and 13 pronounceable nonwords (arrate, disler, hould, falfold, subting, reweat, plabage, dropant, ordiful, seblement, sheal, thimmery, wiltial) taken from a similar recognition vocabulary measure employed by Zimmerman et al. (1977). The words and nonwords were randomly intermixed throughout the list. The children were told that some of the letter strings were actual words and that others were not and that their task was to read through the list of items and to put a check mark next to those that they knew were words. The children were told not to guess, but only to check those strings that they knew to be words. The word checklist took approximately 5 minutes to administer. Scoring was analogous to the other checklist measures. Sixty children completed Form 1 of the vocabulary checklist.

Vocabulary Checklist - Form 2. Instructions, administration, and scoring of Form 2 of the vocabulary checklist were analogous to those of Form 1. The stimuli for Form 2 were 27 mental state words (assert, suggest, assume, remember, claim, prove, concede, predict, understand, believe, think, conclude, observe, confirm, interpret, contradict, infer, criticize, imply, declare, hypothesize, define, explain, deny, doubt, discover, mean) taken from the list in Olson and Astington's (1990) paper on the role of literacy in the development of the Graeco-Latinate component of vocabulary (see also, Corson, 1985). Thirteen pronounceable nonwords (coure, pased, prieng, shured, snaptor, stram, sputer, cumalink, depgeny, misno, hinsie,

meild, glufe) taken from Zimmerman et al. (1977) were employed as foils. Fifty-seven children completed Form 2 of the vocabulary checklist. The two forms of the vocabulary checklist displayed a correlation of .42 and were combined into a composite score by giving each subject a z-score on each form and then averaging the z-scores.

Peabody Picture Vocabulary Test. Items from Form L of the Peabody Picture Vocabulary Test - Revised (PPVT; Dunn & Dunn, 1981) were group-administered to the children. The stimuli consisted of 25 of the Peabody items ranging in number from 49 to 128. The words were: faucet, capsule, trunk, disagreement, exhausted, arid, cooperation, fatigued, mercantile, feline, tubular, barricade, tranquil, cornea, inflated, adjustable, fragile, appliance, peninsula, upholstery, arch, contemplating, dissecting, transparent, pedestrian. The children were told that they would be looking at four picture alternatives while the experimenter said a word out loud. Their task was to choose one of the four pictures that best described the meaning of the word the experimenter said out loud. The experimenter said the name of each word twice. The children then wrote down the number of one of the pictures on a separate score sheet. The task took approximately 10 minutes. Sixty children completed the task.

Metropolitan Vocabulary. The children were administered 20 items from the Vocabulary in Context and Word Part Clues sections of the Reading Instructional test of the Metropolitan Achievement Tests (Form JI, Intermediate; Farr, Prescott, Balow, & Hogan, 1978). This is a multiple-choice test in which the child chooses one of four alternatives that fits in with a sentence. The child reads along with the experimenter as the latter reads the sentence with a blank and then the four alternatives. Fifty-seven children completed the task.

Gates Vocabulary. The children were administered 13 items from the Vocabulary subtest (Level E, Form 1) of the Gates-MacGinitie Reading Tests (MacGinitie, 1978). This is a multiple-choice test in which the child chooses one of four alternatives that is synonymous with a word read by the experimenter. Sixty children completed the task.

Because the PPVT, Metropolitan, and Gates vocabulary measures were all brief tasks with very modest individual reliabilities (ranging between .40 and .60) and that were intercorrelated with each other (.48, .57, and .55, respectively), performance on the three tasks was combined into a composite

index of vocabulary. For each subject, the raw number of items correct on the PPVT, Metropolitan, and Gates vocabulary tasks were converted to z-scores. These three z-scores were then averaged to form a composite index of overall vocabulary performance.

Knowledge - PIAT. The General Information Subtest of the Peabody Individual Achievement Test (PIAT; Dunn & Markwardt, 1970) was employed as a probe of the children's general world knowledge. Eighteen items from the subtest were group administered to the children, ranging in difficulty from Item 19 ("What is a piece of land called that is completely surrounded by water?") to Item 64 ("What branch of our national government makes the laws?"). The remaining items administered were numbers 20, 22, 24, 26, 28, 31, 35, 38, 45, 49, 54, 55, 56, 59, 60, and 62. The experimenter read each question twice out loud to the children, who were instructed to write down their best answer on the scoresheet provided . The children were told that they were going to be asked many questions about the world in which they lived, that many of the questions would be difficult, and therefore they should not expect to be able to answer all of the questions. They were told to write down their best answer even if they were not sure. The task took 10-15 minutes to administer. Sixty children completed the task.

Knowledge - WISC. The children were administered in group format the General Information Subtest of the Weschler Intelligence Scale for Children - Revised (Wechsler, 1974). Fourteen items from the subtest were administered to the children, ranging in difficulty from Item 6 ("What do we call a baby cow?") to Item 26 ("What causes iron to rust?"). The remaining items administered were numbers 8, 10, 11, 13, 14, 15, 16, 18, 19, 20, 22, and 23. Instructions and administration were otherwise like the PIAT General Information subtest. Fifty-nine children completed the task.

Knowledge - Kaufman Riddles. The children were administered in group format the Riddles Subtest of the Kaufman Assessment Battery for Children (Kaufman & Kaufman, 1983). In this subtest the children are orally presented riddles that require knowledge of the world in order to solve. According to the Interpretive Manual of the Kaufman, the Riddles subtest has "much in common with measures of general information and with the Wechsler and Stanford-Binet Similarities tasks" (p. 54). Ten items from the subtest were group administered to the children, ranging in difficulty from Item 11 ("What has wings, is flown by a pilot, and carries people in the air?")

to Item 32 ("What is a form of government, has some people representing others, and needs people to vote?"). The remaining items administered were numbers 14, 15, 18, 21, 28, 29, 30, and 31. The experimenter read each question twice out loud to the children, who were instructed to write down their best answer on the scoresheet provided. Fifty-seven children completed the task.

Because the PIAT, WISC, and Kaufman Riddles were all brief tasks that with very modest reliabilities (ranging between .50 and .60) and that were intercorrelated with each other (.62, .52, and .51, respectively), performance on the three tasks was combined into a composite index of general knowledge. For each subject, the raw number of items correct on the PIAT, WISC, and Riddles tasks was converted to a z-score. These three z-scores were then averaged to form a composite index of general knowledge.

ERB - Vocabulary. In December of the academic year the school administered to the children portions of the Educational Records Bureau (ERB) Aptitude Achievement Test (Level 3, Form C; Educational Testing Service, 1982). The vocabulary subtest is a 35-item test that the students have 20 minutes to complete. It is a multiple-choice format and the reported reliability is .81. Standard scores for all sixty-three children were available from this subtest.

ERB - Reading Comprehension. Standard scores for all 63 children were also available from the reading comprehension subtest of the (ERB) Aptitude Achievement Test (Level 3, Form C). The reading comprehension subtest is a 45-item test that the students have 45 minutes to complete. Children must read passages and then answer multiple choice questions about them. The reported reliability is .87.

ERB - Math Computation. Standard scores for all 63 children were also available from the mathematics computation subtest of the (ERB) Aptitude Achievement Test (Level 3, Form C). The mathematics computation subtest is a 60-item test that the students have 40 minutes to complete. It is a multiple-choice format and the reported reliability is .90.

Procedure

The Educational Records Bureau (ERB) Aptitude Achievement Test was administered to the children in their classrooms by their teachers in December of the school year. During the first experimental session in January the children were administered the Activity Preference

Questionnaire, Literacy and Media Habits Questionnaire, TRT (Form 1), PPVT, PIAT - general information, vocabulary checklist (Form 1), Gates - vocabulary, ART, and WISC - general information, tasks in that order. During the second testing period in April the children were administered the Metropolitan - vocabulary, Kaufman Riddles, vocabulary checklist (Form 2), Comics Recognition Test, TRT (Form 2), and ERAS tasks, in that order. Both sessions took place in the students' classrooms. The activity diaries were completed during the mid-April to early-May period.

Results

Daily Activity Diaries

Table 1 presents the mean and median minutes per day spent in the various categories of activity that were listed on the daily activity records (with the exception of All Reading, which is a composite). The finding that the means were generally larger than the medians reflects the positive skew of most of the variables, particularly the reading variables. The positive skew of reading time has repeatedly been observed in activity diary studies (Anderson et al., 1988; Greaney, 1980). Although some of our categories were different from those of the Anderson et al. (1988) study, those that were common did order somewhat similarly across the two studies. For example, television watching was the most frequent activity and book reading was far down the list in both studies. In terms of the absolute time estimates there were some differences. Our fifth graders watched less television (mean of 83.2 min versus 131.1 min) and did more homework (49.0 min versus 18.9 min) than the Anderson et al. fifth graders. These differences might have been due to the fact that ours was a private school sample and the Anderson et al. study was conducted in public schools. Previous studies have found public/private school differences in homework and television habits (Coleman, Hoffer, & Kilgore, 1982).

Insert Table 1 about here

Despite differences in the estimates in other categories, our estimates of book-reading time (mean and median of 10.2 and 5.0 min, respectively) are very close to those obtained in the Anderson et al. study (10.1 and 4.6 min). Certain rough generalizations thus hold across the two studies: Fifth graders spend around five minutes per night reading books for pleasure

(based on the median), less than one tenth the amount of time they spend watching television.

Table 2 presents the correlations among the estimates of the minutes per day spent in all of the categories on the activity forms. Due to the skewness of most of the variables, all time estimates have been transformed by taking the natural log of the absolute time plus one minute. The split-half reliabilities of the time estimates in each category (Spearman-Brown corrected), based on an odd/even day split, are presented in the diagonal. Although the time estimates for a few categories had fairly low reliabilities (doing chores, talking, doing family things), the categories most central to our subsequent analyses displayed either high (television: .92) or moderate reliabilities (book reading: .68, all reading: .78).

Insert Table 2 about here

A perusal of the correlation matrix in Table 2 reveals that there were few significant relationships among the activities. Among the few significant relationships were negative correlations between television and book reading (-.28) and television and all reading (-.34). The correlation between book reading and television watching increased to -.38 ($p < .01$) when reading comprehension (as measured by the ERB test) was partialed out.

A data-determined stepwise multiple-regression analysis was carried out in which an attempt was made to predict book-reading time (this, and all subsequent analyses are carried out on the log-transformed variables). Potential predictor variables were reading comprehension scores and all the time estimates from the activity records not involving reading. The first variable to enter the equation was reading comprehension (multiple $R = .44$), followed by television watching time (multiple $R = .56$). No other variable entered the equation after these two. Television viewing time had a significant negative beta weight in the final equation (-.344, $p < .01$). Thus, children who watched more television read less, but no other way in which they spent their time predicted book reading after television watching and reading comprehension were taken into accounted.

Intercorrelations of Habits and Attitudes Measures

In Table 3 are listed the intercorrelations among the various measures of print/television habits and attitudes. Book-reading times (with titles) and

television times were the two variables taken from the daily activity records. The four recognition checklist measures of print exposure (two forms of the TRT, ART, and comics recognition), activity preference choices of reading, reading disposition question, and ERAS scales were the additional measures of reading habits and preferences. The activity preference choices of television and the composite of the three television questions on the Literacy and Media Habits Questionnaire were used as additional measures of television preference.

Insert Table 3 about here

Generally, the print-exposure measures displayed significant correlations with each other and the television-exposure measures were significantly intercorrelated. The print and television measures did not correlate with each other. In fact, most of these correlations were negative, although many did not attain statistical significance. This pattern of correlations suggests that the measures have both convergent and divergent validity.

In Table 3 we can examine the question of whether the time estimates of reading activity derived from the diary method correlate with the recognition checklist measures that we have developed. Book-reading time, as measured by the activity diaries correlated significantly with both forms of the TRT (.48 and .43) and with the ART (.52). These correlations are, in fact, substantial when we consider the modest reliabilities of both variables. Corrected for attenuation (Ghiselli, Campbell, & Zedeck, 1981, p. 241) the correlations of bock-reading minutes from the activity diaries with the two forms of the TRT are .65 and .59, and with the ART, .70. Additionally, the two forms of the TRT displayed uncorrected correlations of .65 with each other and correlations of .70 and .52 with the ART. Collectively, these results indicate that the recognition checklist measures (TRT and ART specifically) are tapping a common construct with book reading minutes as estimated from the daily activity records. We would argue, quite simply, that the construct is exposure to print outside of school.

Book-reading minutes from the activity diaries did not, however, correlate with the comics recognition measure. And the comics recognition measure correlated only modestly with the TRT and ART (.38, .27, .35;

significant in two cases). This finding is somewhat consistent with previous results (Anderson et al., 1988; Kirsch & Jungeblut, 1986; Nell, 1988) and with speculations that comic-book reading is functionally different from book reading (Greaney, 1980).

Book reading estimated from the activity records failed to correlate significantly with reading choices on the activity preference measure but did correlate significantly with the reading disposition question on the Literacy and Media Habits Questionnaire. Book reading from the activity records correlated with the ERAS recreational scale but not the ERAS academic scale. In fact, even though the two scales of the ERAS displayed a correlation of .52, the recreational scale consistently correlated more highly with measures of print exposure. This finding bolsters the conclusion that the activity diaries and recognition checklist measures are tapping more heavily attitudes toward recreational, nonschool reading.

Finally, the three different measures of television habits and attitudes (the activity records, choices of television on the activity preference measure, and three questions from the Literacy and Media Habits Questionnaire) were all significantly intercorrelated (.33, .63, .44).

As a further method of exploring the relationships among the reading habits and attitudes measures, the variables listed in Table 3 were subjected to several methods of factor analysis (N=43, casewise elimination of missing data was employed). Different techniques of communality estimation (including principal-components solutions) were tried, and several orthogonal and oblique rotations were computed. The results of a typical solution are displayed in Table 4. In this analysis, squared multiple correlations were used as communality estimates, iteration to a stable solution was carried out, and a varimax rotation was employed. The three factors retained accounted for 52.9% of the total variance. Table 4 lists all factor loadings greater than .250. (The general pattern of factor loadings obtained by other factoring methods was highly similar to that displayed in Table 4.) Factor 1 is clearly the most general print-exposure factor, receiving loadings from all reading habits and attitudes measures except the ERAS academic scale. Factor 2 is clearly a television habits and attitudes factor. Factor 3 is quite interesting in that it does not receive loadings from television measures or from any of the print-exposure measures that employ the recognition checklist logic; nor does it receive a loading from the activity

diary estimate of minutes spent book reading. Instead, Factor 3 loads on the activity preference measure of reading habits, the reading disposition question, and the two ERAS scales. In other words, Factor 3 is defined by loadings on the three indicators that employed questionnaire measures of attitudes about reading rather than indicators of actual behaviors (such as the recognition checklist and activity diary measures). This pattern, in conjunction with the pattern displayed for Factor 1, suggests interpreting Factor 3 as "disposition toward reading" factor--an attitudinal index of subjective feelings about the activity of reading. Factor 1, in contrast, might be interpreted as a latent index of actual print exposure. Although some of the questionnaire measures load on it also, this factor is dominated by print recognition measures (which cannot be faked) and the book reading minutes estimate from the activity diary which shows a loading of .629.

Insert Table 4 about here

Predictive Correlations

Another way to assess whether activity diaries and recognition checklist measures of print exposure are really tapping the same behaviors is to see whether they display similar relationships to cognitive outcomes in the verbal domain. Table 5 displays the correlations between the measures of print and television habits and five criterion measures of verbal achievement and a measure of math computation skill. The five verbal criterion variables are: the z-score composite of performance on the vocabulary checklist tasks, the z-score composite of performance on the PPVT, Metropolitan vocabulary, and Gates vocabulary measures, the z-score composite of performance on the general knowledge measures (WISC, PIAT, and Kaufman Riddles), the ERB vocabulary subtest, and ERB reading comprehension subtest. The sixth criterion variable was performance on the ERB mathematics computation subtest. To the extent that print exposure is related to achievement, this should be more true in the verbal than in the mathematical domain, particularly with respect to mathematics computation, as opposed to conceptual mathematical knowledge.

Insert Table 5 about here

An examination of Table 5 indicates that all of the measures of print habits and attitudes except the ERAS were consistently related to the verbal ability measures. Form 1 of the TRT, the ART, comics recognition, activity preference for reading, and reading disposition question displayed significant correlations with all five verbal achievement measures. The book-reading minutes estimate from the activity diary displayed significant correlations with four of the five verbal ability measures and Form 2 of the TRT with three of the five verbal ability measures. In contrast, only two of ten correlations involving the ERAS were statistically significant, both of these involving the recreational scale. No measure of television habits displayed a significant positive correlation with verbal ability. Indeed, most of the correlations here were negative; four involving the activity preference measure were significant.

In contrast to the verbal achievement measures, performance on the mathematics computation subtest of the ERB displayed significant correlations with only two of nine print habits and attitudes measures. Thus, divergent validity was demonstrated. Print exposure was more strongly linked to performance in the verbal domain than in the domain of math computation. For example, tests for differences between dependent correlations (Cohen & Cohen, 1975, p. 53) indicated that the correlation with reading comprehension was significantly greater ($p < .05$) than the correlation with mathematics computation for book-reading diary minutes, the ART, Comics recognition, activity preference for reading, and the reading disposition question.

Finally, it is clear that the recognition checklist measures of print exposure appear to have as much predictive power as the measure of book reading derived from the activity records. The TRT (Form 1), ART, and comics recognition measures predicted the criterion variables at least as well as did the diary measure (indeed, consistently better in the case of the ART). Only Form 2 of the TRT consistently failed to predict as well as the diary measure, and even it displayed significant correlations in three out of five cases. It should be remembered that the items on Form 2 and Form 1 were totally nonoverlapping and that, as previously mentioned, there were two problematic foils in Form 2.

We attempted to further assess the convergent and divergent validity of the recognition checklist measures of print exposure in a set of analyses

displayed in Table 6. This table presents the results of a series of user-determined stepwise regression analyses utilizing the vocabulary subtest of the ERB as the criterion variable. In each of the analyses, performance on the mathematics computation subtest of ERB was forced into the equation first as a control for school learning ability in a nonverbal domain. The six regression analyses then display the results of entering each of the four recognition checklist measures of print exposure and two of the questionnaire measures into the equation next. Thus, the second step, in effect, asks the question of whether each reading habits indicator can predict vocabulary scores after controlling for general learning ability in a largely nonverbal domain. The answer was "yes" in four out of six cases (diary reading time would also have explained significant variance if entered as the second step--unique variance explained = 9.7%, $F(1,54)=7.11$, $p < .01$).

Insert Table 6 about here

Finally, to examine whether the unique variance explained by the print-exposure measures overlapped with that explained by the book reading measure from the diary, the latter was forced into the equation as the third variable. In three of the first four analyses--involving recognition checklist measures--once a checklist measure was entered, book minutes from the diary lost the ability to independently predict vocabulary scores (this outcome also occurred even when math computation was not entered into the equation). Thus, the variance in vocabulary scores explained by book-reading minutes is variance that is largely shared with the checklist print exposure measures. The only case where book-reading minutes predicted vocabulary scores after the math computation control and a checklist measure were in the equation was in the analysis involving comics recognition, a result consistent with the assumption that the comics recognition measure is a proxy for comics reading specifically, and not generic literacy activity. This outcome again reinforces our previous conclusion that comic reading has cognitive correlates somewhat different from book reading (see Greaney, 1980).

The last two analyses reveal that the variance in vocabulary scores explained by the activity preference measure and the reading disposition question was not completely coextensive with that explained by diary-

estimated book-reading time because the latter predicted significant additional variance when either of these variables were in the equation. The results of these two analyses converge with the results of the factor analysis (see Table 4) which indicated that the recognition checklist measures loaded with the activity diary measure and that the questionnaires formed a separate factor.

Finally, the converse analysis--entering the checklist measures after mathematics computation and book-reading minutes--led to almost parallel results. Neither Form of the TRT predicted unique variance in vocabulary scores, but comics recognition did (13.8%, $F(1,52)=12.03$, $p < .01$). Unlike the other analysis, however, performance on the ART predicted significant unique variance (9.1%, $F(1,53)=7.50$, $p < .01$). The activity preference measure predicted significant unique variance (9.8%, $F(1,54)=8.36$, $p < .01$), but the reading disposition questionnaire did not.

Discussion

The results of our study add to the rather sparse data on the validity of different methods of measuring print experience. Most importantly, this study has legitimized the recognition checklist measures as convenient proxy indicators of children's print exposure. As argued previously, it would seem reasonable--given previous research--to consider the daily activity diary method as the benchmark indicator of children's print exposure. Thus, we have evaluated the utility of the recognition checklist print-exposure measures in reference to and by comparison with the book-reading time measure from the activity diary.

Our data demonstrate that certain recognition checklist measures of print exposure--two forms of a title recognition test and an author recognition test-- correlate moderately with diary reading time. The TRT and ART show virtually the same ability to predict achievement and verbal outcomes as does diary-reading time. The checklist measures also show the same ability to predict verbal outcomes independent of nonverbal academic achievement. Additionally, diary-reading time did not predict verbal outcomes once variance accounted for by the TRT or ART was removed.

The results for the comics recognition checklist measure were different. It did not correlate with diary-estimated book-reading time. Its correlations with TRT1, TRT2, and ART were significant in two cases, but consistently modest (.38, .27, .35). This relative independence of book and comics reading

is consistent with previous research (Anderson et al., 1988; Greaney, 1980). Thus, we would argue that it is real, rather than an artifact of low reliability and/or validity for the comics recognition measure. While it is true that the reliability of the measure was modest (split-half = .68, Cronbach's alpha = .76) there were other indications that the measure was sensitive. The correlation between the checklist comics measure and diary-estimated comics-reading time (.27) is not very meaningful because during the course of our study only 25 of 61 children reported any comic reading time at all. However, a comparison of those children who reported any comics reading time at all versus those that did not revealed that the former scored significantly higher on the comics-recognition checklist (.379 versus .298, $t(54) = 2.27$, $p < .05$), indicating at least some convergent validity for the measure. Most importantly, comics recognition did display the ability to predict cognitive outcomes, independently of general nonverbal achievement (see Table 6).

An important finding of our research was that the questionnaire methods of assessing reading habits and attitudes behaved somewhat differently than the recognition checklist and diary measures. The ERAS was generally a poor predictor of verbal outcomes. The activity preference reading measure and the reading disposition question were, in contrast, good predictors of verbal outcomes. However, as Table 6 reveals, the variance in verbal outcomes that they predict is not as coextensive with diary-estimated book-reading time as was the TRT and ART.

The results of the analyses displayed in Table 6 converged with the results of the factor analysis (see Table 4) which indicated that the recognition checklist measures loaded with the activity diary measure and that the questionnaires formed a separate factor. We interpret the latter factor as a dispositional/attitudinal trait that is somewhat different from actual print-exposure itself, which we think is better measured by the diary and by the checklists.

In summary, the recognition checklist measures of print exposure appear to provide reasonably reliable and valid measures of reading experience. Their advantage over the method of collecting daily activity records is that they are very easy to administer and do not require the time commitment on the part of the children, the teachers, or the investigator that the collection of activity records necessitates. The defect of the checklist

measures is that they only give indications of relative differences in exposure to print. They are very indirect proxies for reading experience, and they do not assess absolute quantities of print exposure as do daily activity records that yield estimates of reading time in minutes (that can then be transformed into other important estimates, such as words read during a year of free reading--see Anderson et al., 1988).

However, certain types of investigations may not require the absolute estimates of time. For example, general studies of the cognitive consequences of print exposure require only relative indices that can be used in correlational analyses (see Cunningham & Stanovich, 1991; Stanovich & Cunningham, 1992; Stanovich & West, 1989; West & Stanovich, 1991). When this is the case, the checklist measures provide the investigator with an easily administered indicator. The results reported here provide at least some assurance that the investigator would be tapping the same print-exposure construct as studies employing the daily activity record approach.

Finally, although our investigation was not focused on the measures of television habits, a word about them is in order. First of all, these measures contributed to the ability of the study to assess convergent and divergent validity. Specifically, the television measures correlated among themselves, but they did not correlate with the measures of print habits and attitudes (see Table 3). In the factor analysis (see Table 4) the television measures formed a separate factor. Unlike the print measures, television watching did not correlate positively with the verbal outcome variables (see Table 5). In fact, to the extent that television viewing correlated with either print exposure or verbal ability at all, those correlations were negative, a result contributing to the general research consensus that television is negatively, but weakly, related to both recreational reading and reading ability (Beentjes & van der Voort, 1988; Comstock & Paik, 1991; Neuman, 1988; Williams, Haertel, Haertel, & Walberg, 1982; Zill & Winglee, 1990).

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Table 1

Minutes Spent per Day in Various Activities for the Sample (N=61)

Activity	Mean	Median
Eating	52.9	54.6
Doing Chores	6.6	5.0
Homework	49.0	45.0
Lessons	4.5	0.0
Practices	14.3	8.0
Book Reading (with title)	10.2	5.0
Reading Comics	2.1	0.0
All Reading	21.3	16.0
Hobbies	7.9	0.0
Playing Outdoor Games	25.7	18.0
Playing Indoor Games	14.5	8.6
Just Playing Around	35.7	26.0
Talking	17.0	13.6
Watching Television	83.2	68.0
Doing Family Things	18.0	13.9
Other	62.6	60.0

Table 2

Intercorrelations of the Logarithms of the Times Spent in Various Activities

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Eating	.86										
2. Doing Chores	.21	.25									
3. Homework	.25	.13	.81								
4. Lessons	.17	.04	.11	.51							
5. Practices	-.09	.17	-.19	.41*	.80						
6. Book Reading (with title)	.08	-.02	.07	.22	-.13	.68					
7. Reading Comics	-.02	-.18	-.02	-.11	.00	-.07	.57				
8. All Reading	.16	.03	.15	.22	-.11	.77*	.15	.78			
9. Hobbies	-.05	.02	-.12	.14	.11	-.09	.31*	.09	.91		
10. Playing Outdoor Games	.13	-.05	-.12	.26*	.29*	-.24	-.09	-.10	.20	.62	
11. Playing Indoor Games	-.07	.09	.07	.04	-.15	.07	.18	-.05	.11	.12	.88
12. Just Playing Around	.06	.05	-.11	-.04	-.02	.23	-.03	.29*	-.10	-.13	-.19
13. Talking	-.05	-.05	.02	.01	-.15	-.01	.29*	.03	.12	-.02	.21
14. Watching Television	-.40*	-.16	-.23	-.24	-.16	-.28*	-.01	-.34*	-.13	.04	.04
15. Doing Family Things	.21	-.04	-.16	-.12	-.19	-.22	.05	-.18	.08	-.13	.01
16. Other	.02	.04	.19	.14	.01	-.10	-.09	-.16	.06	-.18	.00

Variable	12.	13.	14.	15.	16.
12. Just Playing Around	.88				
13. Talking	-.14	.48			
14. Watching Television	-.26*	-.01	.92		
15. Doing Family Things	.07	-.17	-.02	.43	
16. Other	-.11	-.06	-.08	-.03	.82

* = correlations significant at the .05 level (two-tailed)

Correlations underlined in the diagonal are the split-half reliabilities (Spearman-Brown corrected) of the raw times spent in various activities. All correlations are based on an N of 61.

Table 3

Intercorrelations of Differing Measures of Reading Habits

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.
1. Book Reading (diary)									
2. TRT - Form 1	.48*								
3. TRT - Form 2	.43*	.65*							
4. ART	.52*	.70*	.52*						
5. Comics Recognition	.11	.38*	.27	.35*					
6. Activity Preference - reading	.25	.34*	.34*	.35*	.40*				
7. Reading Disposition Question	.41*	.56*	.54*	.49*	.31*	.47*			
8. ERAS - recreational	.37*	.39*	.37*	.34*	.24	.55*	.54*		
9. ERAS - academic	-.08	-.05	.12	-.05	.03	.30*	.10	.52*	
10. Television (diary)	-.32*	-.20	-.17	-.26	.14	.03	-.18	-.10	.06
11. Activity Preference - TV	-.13	-.09	-.04	-.27*	-.11	-.40*	-.22	-.02	-.09
12. Television Composite	-.22	-.22	-.19	-.18	-.01	-.07	-.32*	.06	.26

Variable	10.	11.
10. Television (diary)		
11. Activity Preference - television	.33*	
12. Television Composite	.63*	.44*

Correlations involving Book Reading (diary), TRT (Form 1), ART,Activity Preference - reading, Reading Disposition Question, and all television measures are based on an N of 57. Correlations involving Comics Recognition are based on an N of 53. Correlations involving TRT (Form 2) and the ERAS are based on an N of 43.

* = correlations significant at the .05 level (two-tailed)

Table 4

Factor Loadings for all Variables after Varimax Rotation

Variable	Factor		
	1.	2.	3.
1. Book Reading (diary)	.629	---	---
2. TRT - Form 1	.870	---	---
3. TRT - Form 2	.661	---	---
4. ART	.768	---	---
5. Comics Recognition	.419	---	---
6. Activity Preference - reading	.442	---	.596
7. Reading Disposition Question	.674	---	.292
8. ERAS - recreational	.437	---	.660
9. ERAS - academic	---	---	.697
10. Television (diary)	---	.669	---
11. Activity Preference - television	---	.423	---
12. Television Composite	---	.900	---

Factor loadings lower than .250 have been eliminated.

Table 5

Correlations Between Measures of Reading Habits and Criterion Variables

Reading Habits Measures	Criterion Variables 1.	2.	3.	4.	5.	6.
1. Book Reading (diary)	.41*	.30*	.25	.39*	.46*	.19
2. TRT - Form 1	.57*	.28*	.30*	.38*	.50*	.36*
3. TRT - Form 2	.30*	.12	.21	.32*	.37*	.26
4. ART	.51*	.40*	.47*	.54*	.53*	.28*
5. Comics Recognition	.63*	.59*	.48*	.46*	.37*	.11
6. Activity Preference - reading	.47*	.44*	.39*	.47*	.50*	.24
7. Reading Disposition Question	.44*	.38*	.31*	.28*	.39*	.19
8. ERAS - recreational	.40*	.12	.08	.30*	.23	.18
9. ERAS - academic	.07	-.20	-.23	-.06	-.10	-.02
10. Television (diary)	-.14	.04	.12	-.09	.03	.04
11. Activity Preference - TV	-.26	-.30*	-.28*	-.28*	-.34*	-.24
12. Television Composite	-.18	-.14	-.21	-.17	-.18	-.03

Key to Criterion Variables:

1. Vocabulary checklist z-score
2. Vocabulary z-score (PPVT, Metropolitan, Gates)
3. General knowledge z-score (PIAT, WISC, Kaufman Riddles)
4. ERB - vocabulary
5. ERB - reading comprehension
6. ERB - math computation

Correlations involving TRT (Form 2) and the ERAS are based on an N of 44. All other correlations are based on an N of 53.

* = correlations significant at the .05 level (two-tailed)

Table 6

Stepwise Regressions Analyses Predicting ERB Vocabulary Scores

Step	R	R^2	R^2 Change	F Change
1. Math Computation	.407	.166	.166**	10.93**
2. TRT Form 1	.472	.223	.057	3.96
3. Book Reading (diary)	.524	.275	.052	3.80

	R	R^2	R^2 Change	F Change
1. Math Computation	.274	.075	.075	3.57
2. TRT Form 2	.432	.187	.112*	5.93*
3. Book Reading (diary)	.462	.213	.026	1.41

	R	R^2	R^2 Change	F Change
1. Math Computation	.407	.166	.166**	10.93**
2. ART	.583	.340	.174**	14.24**
3. Book Reading (diary)	.595	.354	.014	1.18

	R	R^2	R^2 Change	F Change
1. Math Computation	.400	.160	.160**	10.27**
2. Comics Recognition	.565	.319	.159**	12.39**
3. Book Reading (diary)	.636	.405	.086**	7.52**

	R	R^2	R^2 Change	F Change
1. Math Computation	.410	.168	.168**	11.34**
2. Activity Preference, Reading	.554	.307	.139**	11.03**
3. Book Reading (diary)	.604	.364	.057	4.85*

	R	R^2	R^2 Change	F Change
1. Math Computation	.410	.168	.168**	11.34**
2. Reading Disposition	.461	.213	.045	3.09
3. Book Reading (diary)	.525	.276	.063*	4.72*

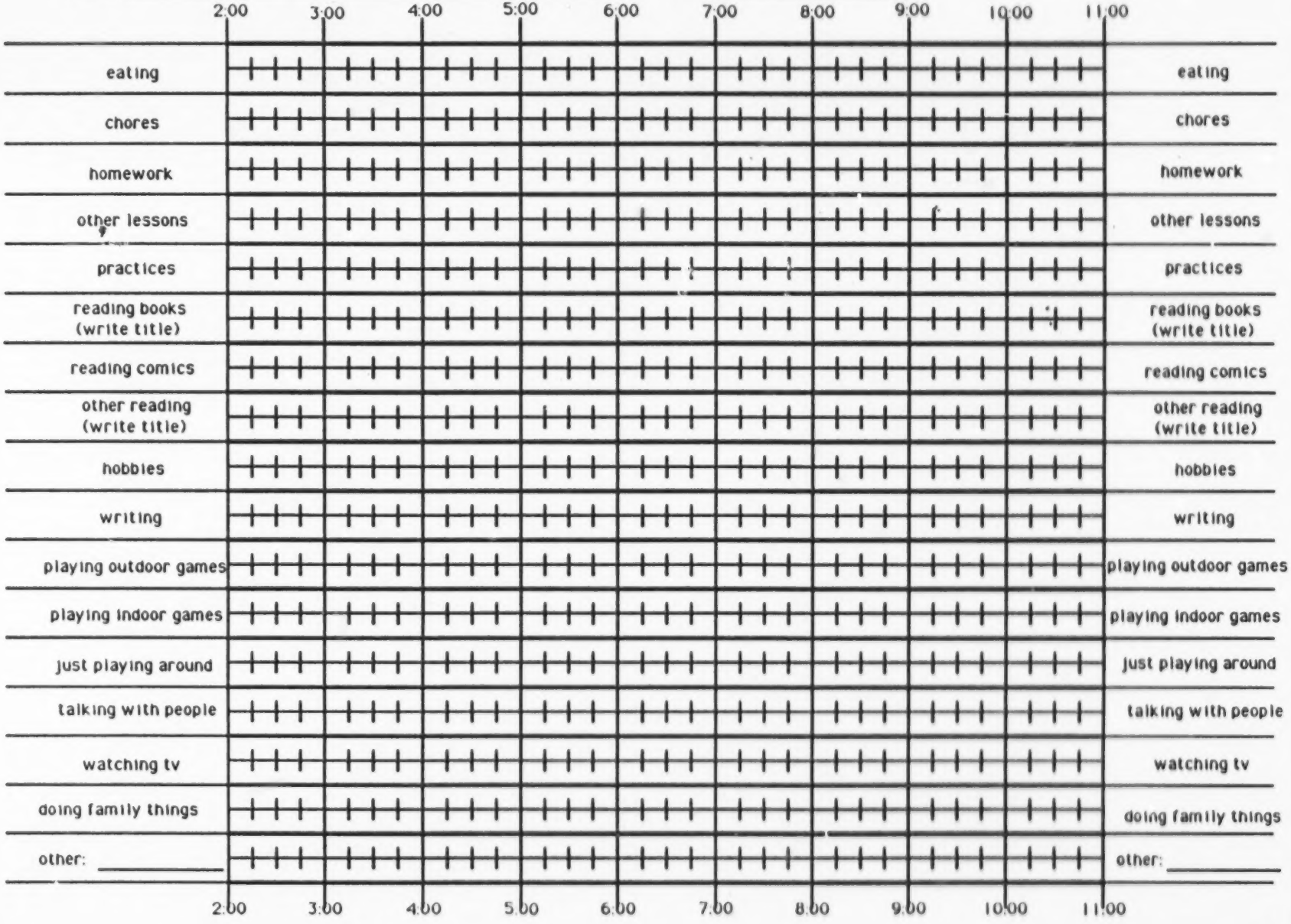
* $p < .05$, ** $p < .01$

Analyses 1 and 3 are based on an N of 57, analysis 2 is based on an N of 46, analysis 4 is based on an N of 56, and analyses 5 and 6 are based on an N of 58

Figure Caption

Figure 1. The Daily Activity Diary Recording Sheet for Weekdays.

Name: _____ Date _____


2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
eating
chores
homework
other lessons
practices
reading books (write title)
reading comics
other reading (write title)
hobbies
writing
playing outdoor games
playing indoor games
just playing around
talking with people
watching tv
doing family things
other: _____

Appendix A
Title Recognition Test Items (Form 1)

	Percentage Recognition
A Light in the Attic	86.4%
How to Eat Fried Worms	89.8%
Call of the Wild	50.8%
Hatchet	66.1%
Tales of a Fourth Grade Nothing	94.9%
The Polar Express	76.3%
The Indian in the Cupboard	69.5%
The Trouble with Tuck	22.0%
Homer Price	32.2%
Heidi	76.3%
Freedom Train	40.7%
James & the Giant Peach	86.4%
By the Shores of Silver Lake	16.9%
Superfudge	84.7%
Dr. Dolittle	86.4%
From the Mixed-Up Files of Mrs. Basil E. Frankweiler	44.1%
Island of the Blue Dolphins	98.3%
Ramona the Pest	94.9%
Iggie's House	32.2%
The Great Brain	64.4%
The Winter Worm Business	10.2%
Henry and the Clubhouse	39.0%
Dear Mr. Henshaw	67.8%
Harriet the Spy	64.4%
The Lion, the Witch and the Wardrobe	93.2%
Foils:	
Joanne	6.8%
It's My Room	8.5%
Hot Top	1.7%
Don't Go Away	5.1%

The Hidden One	6.8%
The Missing Letter	10.2%
The Rollaway	0.0%
Sadie Goes to Hollywood	5.1%
The Case of the Unbreakable Walking Mirror	3.4%
The Schoolhouse	6.8%
He's Your Little Brother!	1.7%
Ethan Allen	5.1%
The Lost Shoe	3.4%
Skateboard	8.5%
Searching the Wilds	1.7%

Appendix B
Title Recognition Test Items (Form 2)

	Percentage Recognition
Soup	57.4%
The Secret Garden	78.7%
The Boxcar Children	66.0%
Rapunzel	63.8%
The Sign of the Beaver	38.3%
My Side of the Mountain	100.0%
A Wrinkle in Time	93.6%
The Trumpet of the Swan	34.0%
The One Eyed Cat	46.8%
M. C. Higgins the Great	34.0%
A Cricket in Times Square	70.2%
The Cat Ate My Gymsuit	59.6%
Thirteen Ways to Sink a Sub	66.0%
The Whipping Boy	57.4%
Bones on Black Spruce Mountain	8.5%
The Mouse and His Child	14.9%
Roll of Thunder, Hear My Cry	66.0%
The Yearling	85.1%
The Great Gilly Hopkins	76.6%
The Way Things Work	53.2%
Nothing's Fair in Fifth Grade	61.7%
The Magic Schoolbus Inside the Earth	6.4%
Scorpions	6.4%
Bunnicula	61.7%
When Hitler Stole Pink Rabbit	97.9%
Foils:	
Katie of Norway	4.3%
Football Freaks	10.6%
Never Lie to Your Teacher	10.6%
The Time Grandpa Found an Alien	2.1%
Swimming With the Sharks	10.6%

Joshua Johnson	2.1%
The Exploits of Hillary and Her Friends	0.0%
Mystery of the Missing Masserati	0.0%
BMX Champions	36.2%
Let's Save the Pandas	6.4%
The Superheroes Fan Club	6.4%
Secret Cottage in Riverside Wood	2.1%
Melvin Meets the Moonlight Monsters	2.1%
Chaos in the Cafeteria	10.6%
The Ghosts in Room 313	31.9%
The Legend of Sean O'Toole	8.5%

Appendix C
Author Recognition Test Items

	Percentage Recognition
Mildred Taylor	16.9%
Patricia MacLachlan	6.8%
Jean Fritz	25.4%
Sid Fleischman	8.5%
John D. Fitzgerald	22.0%
Lois Lowry	42.4%
Jean Craighead George	98.3%
Katherine Paterson	20.3%
Constance Greene	10.2%
Lloyd Alexander	22.0%
Donald T. Sobol	25.4%
Robert Newton Peck	20.3%
Beverly Cleary	94.9%
Roald Dahl	71.2%
Elizabeth George Speare	20.3%
Mary Norton	10.2%
Judy Blume	86.4%
James Howe	18.6%
Jill Kremetz	1.7%
Scott O'Dell	89.8%
Betsy Byars	78.0%
Natalie Babbitt	13.6%
E.B. White	67.8%
E.L. Konigsburg	15.3%
Elizabeth Nesbit	6.8%
Foils:	
J. Harlan Shores	1.7%
Rita Klosterman	0.0%
Thomas Turner	6.8%
Lois Sauer	3.4%
H.T. Fillmore	1.7%

Kenneth Dulin	3.4%
Donald Lashinger	0.0%
Lewis Smith	15.3%
Sidney Rauch	1.7%
H. P. Daniels	8.5%
Hilda Taba	0.0%
Arnold Burron	3.4%
Frank Guszak	1.7%
Joanne Vacca	3.4%
Sara Lundsteen	6.8%